## REMARKS

Claims 1 and 3-32 are pending in the present Application. Claims 7, 9, 22, and 25-26 have been canceled, and claims 1, 10-14, 17-18, 23, and 27-30 have been amended, leaving claims 1, 3-6, 8, 10-21, 23-24, and 27-32 for consideration upon entry of the present Amendment. No new matter has been introduced by these amendments. Reconsideration and allowance of the claims are respectfully requested in view of the above amendments and the following remarks.

Claim Amendments

Claim 1 has been amended to contain the limitations from originally filed claims 7 and 9 directed to a poly(arylene ether) and poly(alkenyl aromatic) polymeric material and a disk that exhibits a percent feature replication of greater than or equal to about 90 percent.

Claims 10-14 have been amended to correct dependency from canceled claim 9 to claim 1.

Claim 17 has been amended to contain the limitations from claims 2 and 7 as originally filed.

Claim 18 has been amended to contain the limitations from claims 22 and 26 as originally filed directed to a poly(arylene ether) and poly(alkenyl aromatic) polymeric material and a disk that exhibits a percent feature replication of greater than or equal to about 90 percent.

Claims 23 and 27-30 have been amended to correct dependency from canceled claim 22 to claim 18.

Claim Rejections Under 35 U.S.C. § 103(a)

Claims 1, 3-6, 15-16, 18-21, 24, 31, and 32 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Rosato's Injection Molding Handbook (3rd ed) ("Rosato"), in view of Davis et al. (U.S. Patent Application Publication 2002/048691) ("Davis"), and further in view of Toshihiko et al. (JP 10-306268) ("Toshihiko").

Rosato is cited for "injection molding a polymeric material at a melt temperature of about 330 to 370°C (Table 4-8, PEEK) into a mold having a mold temperature of about 90 to about

130°C (Table 4-8, PEEK. . . and a clamp tonnage of about 12 to about 35 tons." (3/9/07 Office Action, page 2)

Davis is cited for "an injection molded radial disk exhibits a radial tilt change of less than or equal to 0.35." (3/9/07 Office Action, page 3)

Toshihiko is cited for measuring radial tilt after 96 hours at 80°C. (3/9/07 Office Action, page 3)

Independent claim 1, as currently amended, is directed to a method of molding a disk, which requires injection molding a poly(arylene ether) and poly(alkenyl aromatic) material under specific conditions to result in molded disks having specific properties achievable due to the molding conditions used. Particularly, the conditions require a melt temperature of about 330 to about 370°C, a mold temperature of about 90 to about 130°C, and a clamp tonnage of about 12 to about 35 tons. Such molding conditions were developed by the inventors to obtain a disk percent feature replication of greater than or equal to about 90 percent, and furthermore to provide a disk assembly fabricated from the disk which exhibit a radial tilt change value after 96 hours at 80°C of less than or equal to about 0.35 degree measured at a radius of 55 millimeters. Such stringent requirements for the disk properties were only achievable after intense research and recognition that molding conditions play an important role in the physical properties of the resulting molded article.

Likewise, independent claim 18 is directed to a method of molding a disk, which also requires injection molding a poly(arylene ether) and poly(alkenyl aromatic) material to form disks according to a molding model to achieve molded disks having specific properties of feature replication and radial tilt change when prepared into disk assemblies.

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a *prima facie* case of obviousness, i.e., that all elements of the invention are disclosed in the prior art; and that the prior art relied upon, coupled with knowledge generally available in the art at the time of the invention, contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references. *In re Fine*, 5

U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); *In Re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 U.S.P.Q.2d, 1016, 1023 (Fed. Cir. 1996).

It is the Applicants' contention that Rosato, in view of Davis and Toshihiko fail to render obvious claims 1 and 18 as currently amended.

First, none of the references teach each and every claim limitation required by these claims. Specifically, the injected molded material is the combination of poly(arylene ether) and poly(alkenyl aromatic). The molding conditions taught by Rosato and discussed by the Examiner are directed to PEEK and not the specific material claimed. As indicated by Rosato itself, the conditions for molding are markedly variable depending upon the material being molded:

> Depending on what plastic is being molded, the IMM clamping force may be from less than 20 tons to thousands of tons. The different plastics require different pressures applied on their melt in the mold cavity, ranging from 2000 to 30,000 psi (14 to 207 MPa).

(Rosato, page 60) Furthermore, as indicated by Table 4-8 of Rosato, average melt temperatures range from a low of 100°C (PMMA) to a high of 334°C (PEEK). The mold temperature for unreinforced articles in Table 4-8 also ranges from a low of 25°C (PE) to a high of 230°C (PAI). Such a diverse range of conditions does not teach or suggest the specific molding parameters required in claim 1.

Second, the teaching in Rosato actually teaches *away* from the molding conditions required by claim 1. Specifically, claim 1 requires the poly(arylene ether) and poly(alkenyl aromatic) material to be injection molded with a melt temperature of about 330 to about 370°C and a mold temperature of about 90 to about 130°C. According to Table 4-8 of Rosato, the average melt temperature of polystyrene and polyphenylene oxide is 100°C and 120°C, respectively. Thus, one of ordinary skill in the art would look to using melt temperatures for a poly(arylene ether) and poly(alkenyl aromatic) material of around 100°C and 120°C, a temperature range *significantly* lower than what is required by claim 1. Indeed, the difference between Rosato's suggested melt temperature and the claimed range of about 330 to about 370°C *differs by a factor of three.*

Additionally, the suggested mold temperature of Rosato for polystyrene and polyphenylene oxide is 45°C and 80°C, respectively. Thus, one of ordinary skill in the art would look to using melt temperatures for a poly(arylene ether) and poly(alkenyl aromatic) material of around 45°C and 80°C, a temperature range which again is much lower than what is required by claim 1. Thus, one of ordinary skill in the art would look to Rosato for a teaching or a suggestion of how to injection mold a poly(arylene ether) and poly(alkenyl aromatic) material and would fail to result in the conditions required by claim 1 as both the melt and the mold temperature of Rosato is simply too low.

Finally, guidance by Rosato regarding what clamp tonnage to use in injection molding a poly(arylene ether) and poly(alkenyl aromatic) material to form a disk having specific properties is simply too weak. Rosato fails to teach or suggest the required range of clamp tonnage of 12 to about 35 tons (claim 1). Rosato's teaching of the wide range of potential clamp tonnage (less than 20 tons to thousands of tons, page 60) is simply too variable to lead one of ordinary skill in the art to choose the particular range required by claim 1.

Davis fails to teach or suggest the required molding parameters for a poly(arylene ether) and poly(alkenyl aromatic) material required by claim 1. Davis generally fails to teach or suggest how molding parameters can affect the resulting disk properties of feature replication and radial tilt change. It has been found by the present Applicants what specific injection molding parameters are required in order to obtain disks meeting specific physical properties. Although Davis teaches the preference of low disk tilt, it does not suggest to one of ordinary skill in the art how molding parameters affect this property or how to choose the particular molding conditions to achieve low radial tilt.

Similarly, Toshihiko also fails to teach or suggest the required molding parameters for a poly(arylene ether) and poly(alkenyl aromatic) material required by claim 1. The reference also does not inform one of ordinary skill in the art how molding parameters can affect the resulting disk properties of feature replication and radial tilt change.

As claim 1 requires specific injection molding conditions in order to obtain poly(arylene ether) and poly(alkenyl aromatic) disks having specific feature replication and radial tilt values when prepared into disk assemblies, the cited references fail to teach or suggest each and every claim limitation of the claim. As claim 18 is directed to a specific injection molding process which results in disks having specific feature replication and radial tilt values when prepared into disk assemblies, the cited references also fail to render the claim obvious since none teach or suggest the importance of molding conditions on the claimed properties. Reconsideration and removal of the § 103(a) rejections over independent claims 1 and 18 are respectfully requested since the cited art fails to teach or suggest the combination of elements organized in the manner found in the claims. As claims 3-6 and 15-16 ultimately depend from claim 1, they too have not been rendered obvious.

Claims 7 and 8 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Rosato, Davis, and Toshihiko, further in view of Dhar et al. (U.S. Patent 6,221,536) ("Dhar").

Dhar is cited for its teaching "that it is known to carry out a method wherein the disk exhibits a percent feature replication of greater than or equal to about 90 percent (Column 14, lines 1-4)." (3/9/07 Office Action, page 8) The Examiner further stated that "[i]t would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to follow Dhar's feature replication percentage as a result of Rosato's molding process." (3/9/07 Office Action, page 8)

Claim 7 has been canceled and claim 8 depends from independent claim 1 discussed above. Applicants have reviewed Dhar and find no such teaching of percent feature replication of an injection molded disk. Furthermore, it is also noted that Dhar does not teach or suggest injection molding to obtain a desired feature replication or any property for that matter. Accordingly, the Applicants respectfully request removal of the rejection over claim 8.

Claims 9, 10, and 14 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Rosato, Davis, and Toshihiko, further in view of Adedeji et al. (U.S. Patent Application Publication 2002/0137840) ("Adedeji").

Adedeji is cited for its teaching of polyarylene ether and polyalkenyl aromatic. (3/9/07 Office Action, page 9) The Examiner states that "[i]t would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use Adedji's specifica polymeric structure in Rosato's molding process." (3/9/07 Office Action, page 9)

Claim 9 has been canceled and claims 10 and 14 depend from independent claim 1 discussed above. As mentioned previously, Rosato fails to teach or suggest injection molding a poly(arylene ether) and poly(alkenyl aromatic) material according to the required molding conditions of melt temperature, mold temperature, and clamp tonnage. Although the Examiner was citing conditions for PEEK, the conditions cited in Rosato for polystyrene and polyphenylene oxide were significantly lower than the required melt temperature and mold temperature such that one of ordinary skill in the art would not look to the PEEK conditions as conditions for polystyrene and polyphenylene oxide were provided. Furthermore, based on Rosato, the required specific clamp tonnage range of claim 1 was not even suggested for either polystyrene or polyphenylene oxide.

Adedeji does disclose a thermoplastic containing poly(arylene ether) and a homopolymer of an alkenyl aromatic monomer (Abstract). However, based on Adedeji's teaching of poly(arylene ether) and a homopolymer of an alkenyl aromatic monomer one of ordinary skill in the art would look to Rosato, Table 4-8 and *not* choose the conditions for PEEK, but rather the conditions for polystyrene and/or polyphenylene oxide. These conditions would not lead to the molding conditions required by claim 1 in the manner that the conditions are claimed. Furthermore, Adedeji does not teach or suggest the mold temperature or melt temperature of claim 1, but rather a much lower temperature. (Adedeji, [0089]-[0090]) Indeed, the disclosed mold temperature of Adedeji (100-120°F = 38-49°C) is more in line with what is suggested in Rosato than what is required by the instant claims. (Adedeji, [0090])

Reconsideration and removal of the § 103(a) rejections over claims 10 and 14 are respectfully requested since the cited art fails to teach or suggest the combination of elements organized in the manner found in the claims.

Claim 11 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Rosato, Davis, and Toshihiko and Singh (U.S. Patent 6,407,200) ("Singh"), further in view of Fortuyn et al. (U.S. Patent 6,306,953) ("Fortuyn"). Applicants respectfully traverse this rejection.

Singh is generally directed to a method of preparing a poly(arylene ether). Singh does not teach injection molding parameters or radial stability parameters of disk assemblies.

Fortuyn is cited for disclosing a "polyarylene ether ha[ving] an intrinsic viscosity of about 0.10 to aobut 0.60 deciliters per gram as measured in chloroform at 25°C." (3/9/07 Office Action, page 10)

Claim 11 depends from independent claim 1 discussed above. As mentioned, Rosato, Davis, and Toshihiko fail to teach or suggest each and every limitation of claim 1. Furthermore, Rosato teaches away from using the claimed molding parameters for a poly(arylene ether) and poly(alkenyl aromatic) material. Singh and Fortuyn do not provide the missing teaching. Particularly, Singh does not teach any injection molding parameters at all. Fortuyn does disclose injection molding at about 250 to 320° C, but provides no guidance as to mold temperature or clamp tonnage. As each and every limitation of claim 1 is not taught or suggested by the references, claim 1 and dependent claim 11 have not been rendered obvious. Reconsideration and removal of the rejection are respectfully requested.

Claim 12 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Rosato, Davis, and Toshihiko and Singh, further in view of Allen (U.S. Patent 4,727,093) ("Allen").

Allen is cited for "the polyalkenyl aromatic contains at least 25% by weight of the claimed structural units (see claim listing). (3/9/07 Office Action, page 10)

Claim 12 depends from independent claim 1 discussed above. As mentioned, Rosato, Davis, Toshihiko, and Singh fail to teach or suggest each and every limitation of claim 1. Furthermore, Rosato teaches away from using the claimed molding conditions for a poly(arylene ether) and poly(alkenyl aromatic) material. Allen does not provide the missing teaching. Particularly, Allen does not teach any injection molding parameters at all. As each and every

limitation of claim 1 is not taught or suggested by the references, claim 1 and dependent claim 12 have not been rendered obvious. Reconsideration and removal of the rejection are respectfully requested.

Claim 13 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Rosato, Davis, and Toshihiko and Singh, further in view of Cheung et al. (U.S. Patent 5,872,201) ("Cheung").

Cheung is cited for atactic crystal polystyrene. (3/9/07 Office Action, page 11) Cheung does not disclose specific injection molding parameters or disk assembly dimensional stability.

Claim 13 depends from independent claim 1 discussed above. As mentioned, Rosato, Davis, Toshihiko, and Singh fail to teach or suggest each and every limitation of claim 1. Furthermore, Rosato teaches away from using the claimed molding conditions for a poly(arylene ether) and poly(alkenyl aromatic) material. Cheung does not provide the missing teaching. Particularly, Cheung does not teach any injection molding parameters at all. As each and every limitation of claim 1 is not taught or suggested by the references, claim 1 and dependent claim 13 have not been rendered obvious. Reconsideration and removal of the rejection are respectfully requested.

Claim 17 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Rosato, Davis, and Toshihiko, further in view of Karasz et al. (U.S. Patent 5,286,812) ("Karasz"). Applicants respectfully traverse this rejection.

Karasz is cited for a "polymeric material compris[ing] poly(2,6-dimethyl-1,4-phenylene oxide) and polystyrene." (3/9/07 Office Action, page 11) Karasz does not disclose specific injection molding parameters.

Independent claim 17 is directed to a method of molding a disk, which requires injection molding a poly(2,6-dimethyl-1,4-phenylene oxide) and polystyrene material under specific conditions to result in molded disks having specific properties achievable due to the molding conditions used. Particularly, the conditions require a melt temperature of about 330 to about

370°C, a mold temperature of about 90 to about 130°C, and a clamp tonnage of about 12 to about 35 tons. Such molding conditions were developed by the inventors to obtain a disk percent feature replication of greater than or equal to about 90 percent, and furthermore to provide a disk assembly fabricated from the disk which exhibit a radial tilt change value after 96 hours at 80°C of less than or equal to about 0.35 degree measured at a radius of 55 millimeters. Such stringent requirements for the disk properties were only achievable after intense research and recognition that molding conditions play an important role in the physical properties of the resulting molded article.

It is the Applicants' contention that Rosato, Davis, and Toshihiko, further in view of Karasz fail to render obvious claim 17 as currently amended for the same reasons independent claim 1 has not been rendered obvious (see above). As mentioned, Rosato, Davis, and Toshihiko, fail to teach or suggest each and every limitation required by the instant claims. Furthermore, Rosato teaches away from using the claimed molding parameters for a poly(2,6-dimethyl-1,4-phenylene oxide) and polystyrene material. Karasz does not provide the missing teaching. Particularly, Karasz does not teach any injection molding parameters at all. As each and every limitation of claim 17 is not taught or suggested by the references, the claim has not been rendered obvious. Reconsideration and removal of the rejection are respectfully requested.

Claim 22 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Rosato, Davis, and Toshihiko, further in view of Ohkawa et al. (U.S. Patent 5,525,645) ("Ohkawa"). Claim 22 has been canceled rendering this rejection moot. However, as the limitation of claim 22 has been incorporated into claim 18, the reference will be discussed in relation to claim 18.

Ohkawa is cited for "testing the disks for percent feature replication; creating the updated molding model based on the mold parameter values that resulted in disks exhibiting a percent feature replication within a selected range of values; and repeating the molding, testing and creating steps until the final disks exhibit a percent feature replication of greater than or equal to about 90 percent (Column 12, lines 66-67; Column 13, lines 1-11, 45-67; Column 14, lines 1-2)." (3/9/07 Office Action, page 11) It is noted that Ohkawa does not teach or suggest injection molding at all.

Claim 18 is not obvious over Rosato, Davis, and Toshihiko as previously discussed. Rosato, Davis, and Toshihiko fail to provide the requisite teaching or suggestion to injection mold according to a multi-step molding model comprising certain parameters, testing the resulting disks, updating the molding model, and repeating until the molding parameters of the resulting molding model results in the fabrication of disk assemblies exhibiting a radial tilt change value after aging of less than or equal to about 0.35 degree measured at a radius of 55 millimeters and a percent feature replication of greater than or equal to about 90 percent. Ohkawa fails to cure the deficiencies of Rosato, Davis, and Toshihiko as Ohkawa does not even teach or suggest injection molding. Thus, based on the teachings of Rosato, Davis, Toshihiko, and Ohkawa, one of ordinary skill in the art would not even look to molding parameters as the means to obtain a disk assembly having particular physical properties such as reduced radial tilt as neither of these references teach or suggest the importance of the injection molding parameters to the disk properties such as dimensional stability.

Claim 23 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Rosato, Davis, Toshihiko, and Ohkawa, further in view of Dhar. Applicants respectfully traverse this rejection.

Claim 23 depends from claim 18. As discussed immediately above, Rosato, Davis, Toshihiko, and Ohkawa fail to render obvious independent claim 18. Dhar also fails to teach or suggest a multi-step method of molding disks or the required radial tilt value. Based on the teachings of Rosato, Davis, Toshihiko, Ohkawa, and Dhar, one of ordinary skill in the art would not even look to molding parameters as the means to obtain a disk assembly having reduced radial tilt or improved feature replication as neither of these references teach or suggest the importance of these parameters to final disk properties such as dimensional stability.

Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. §103(a) rejection regarding claim 23.

Claims 25-27 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Rosato, Davis, and Toshihiko, further in view of Singh. Applicants respectfully traverse this rejection.

Claims 25 and 26 have been canceled and claim 27 depends from claim 18. As discussed above, Rosato, Davis, and Toshihiko fail to render obvious independent claim 18. Singh also fails to teach or suggest a multi-step method of molding disks or the required radial tilt value. Based on the teachings of Rosato, Davis, Toshihiko, and Singh, one of ordinary skill in the art would not even look to molding parameters as the means to obtain a disk assembly having reduced radial tilt or improved feature replication as neither of these references teach or suggest the importance of these parameters to final disk properties such as dimensional stability.

Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. §103(a) rejection regarding claim 27.

Claim 28 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Rosato, Davis, and Toshihiko, and Singh, further in view of Fortuyn. Applicants respectfully traverse this rejection.

Claims 28 depends from claim 18. As discussed above, Rosato, Davis, Toshihiko, and Singh fail to render obvious independent claim 18. Fortuyn also fails to teach or suggest a multi-step method of molding disks or the required radial tilt value. Based on the teachings of Rosato, Davis, Toshihiko, Singh, and Fortuyn one of ordinary skill in the art would not even look to molding parameters as the means to obtain a disk assembly having reduced radial tilt or improved feature replication as neither of these references teach or suggest the importance of these parameters to final disk properties such as dimensional stability.

Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. §103(a) rejection regarding claim 28.

Claim 29 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Rosato, Davis, and Toshihiko, and Singh, further in view of Allen. Applicants respectfully traverse this rejection.

Claims 29 depends from claim 18. As discussed above, Rosato, Davis, Toshihiko, and Singh fail to render obvious independent claim 18. Allen also fails to teach or suggest a multi-step method of molding disks or the required radial tilt value. Based on the teachings of Rosato, Davis, Toshihiko, Singh, and Allen one of ordinary skill in the art would not even look to molding parameters as the means to obtain a disk assembly having reduced radial tilt or improved feature replication as neither of these references teach or suggest the importance of these parameters to final disk properties such as dimensional stability.

Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. §103(a) rejection regarding claim 29.

Claim 30 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Rosato, Davis, and Toshihiko, and Singh, further in view of Adedeji. Applicants respectfully traverse this rejection.

Claims 30 depends from claim 18. As discussed above, Rosato, Davis, Toshihiko, and Singh fail to render obvious independent claim 18. Adedeji also fails to teach or suggest a multi-step method of molding disks or the required radial tilt value. Based on the teachings of Rosato, Davis, Toshihiko, Singh, and Adedeji one of ordinary skill in the art would not even look to molding parameters as the means to obtain a disk assembly having reduced radial tilt or improved feature replication as neither of these references teach or suggest the importance of these parameters to final disk properties such as dimensional stability.

Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. §103(a) rejection regarding claim 30.

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance are requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 50-1131.

Respectfully submitted,

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